What's Happening at OSTP?

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OSTP Mission:

1. **Advise the President** (and by implication, EOP.)
2. **Lead interagency effort** to develop sound S&T policies & budgets.
3. **Work with the private sector** to match S&T investments to needs.
4. **Build strong partnerships** among Federal, State, and local governments, other countries, and the scientific community.
5. **Evaluate** the scale, quality, and effectiveness of the Federal effort in science and technology.

External Policy Advisors:

President's Council of Advisors on Science and Technology (PCAST)

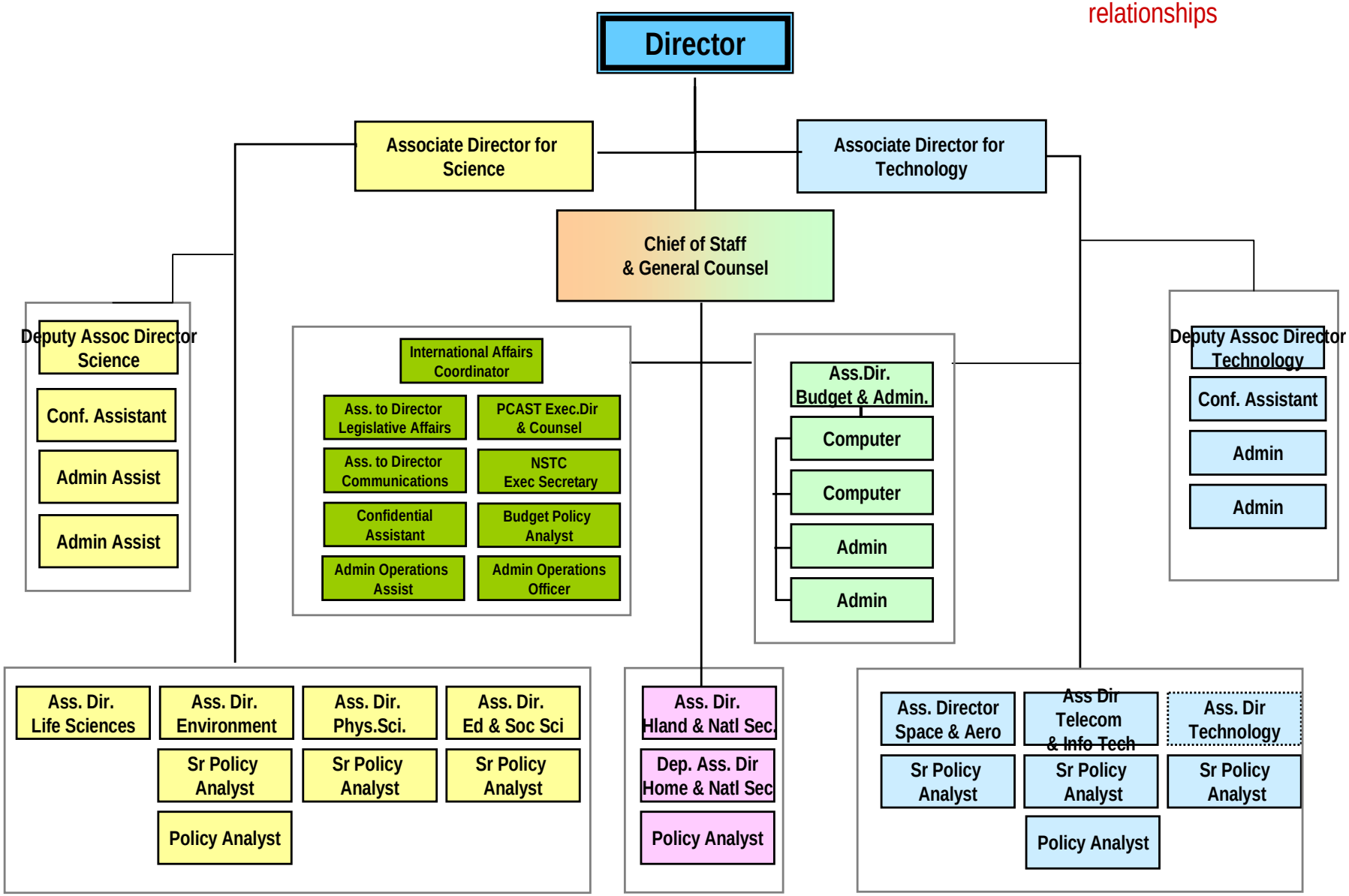
President's Information Technology Advisory Committee (PITAC)

Intergovernmental Policy Council:

National Science and Technology Council (NSTC)

OSTP Organization

reporting relationships



Ongoing OSTP Activities

- Homeland and National Security
  - Department of Homeland Security
  - Sensitive Homeland Security Information
- Technology
  - Nanotechnology*
  - Information Technology*
  - Tech Policy
- Space/Aero
  - Columbia tragedy & Implications
  - Aeronautics
- Telecom/IT
  - Media Ownership, Spectrum Allocation*
- Life Sciences
  - Bioterrorism & Select Agents
  - Human Subjects
- Education/Social Science
  - Scientific visas*
- Agriculture
  - GMOs, Plant/Food Safety, etc.
- Environment
  - Climate Change Research
  - Mercury, Dioxin, etc.
- Physical Sciences
  - Energy
    - Nuclear
    - hydrogen fuel cells
    - Fusion

FY 2005 OSTP/OMB Priorities Memo

1.) R&D for Homeland and National Security

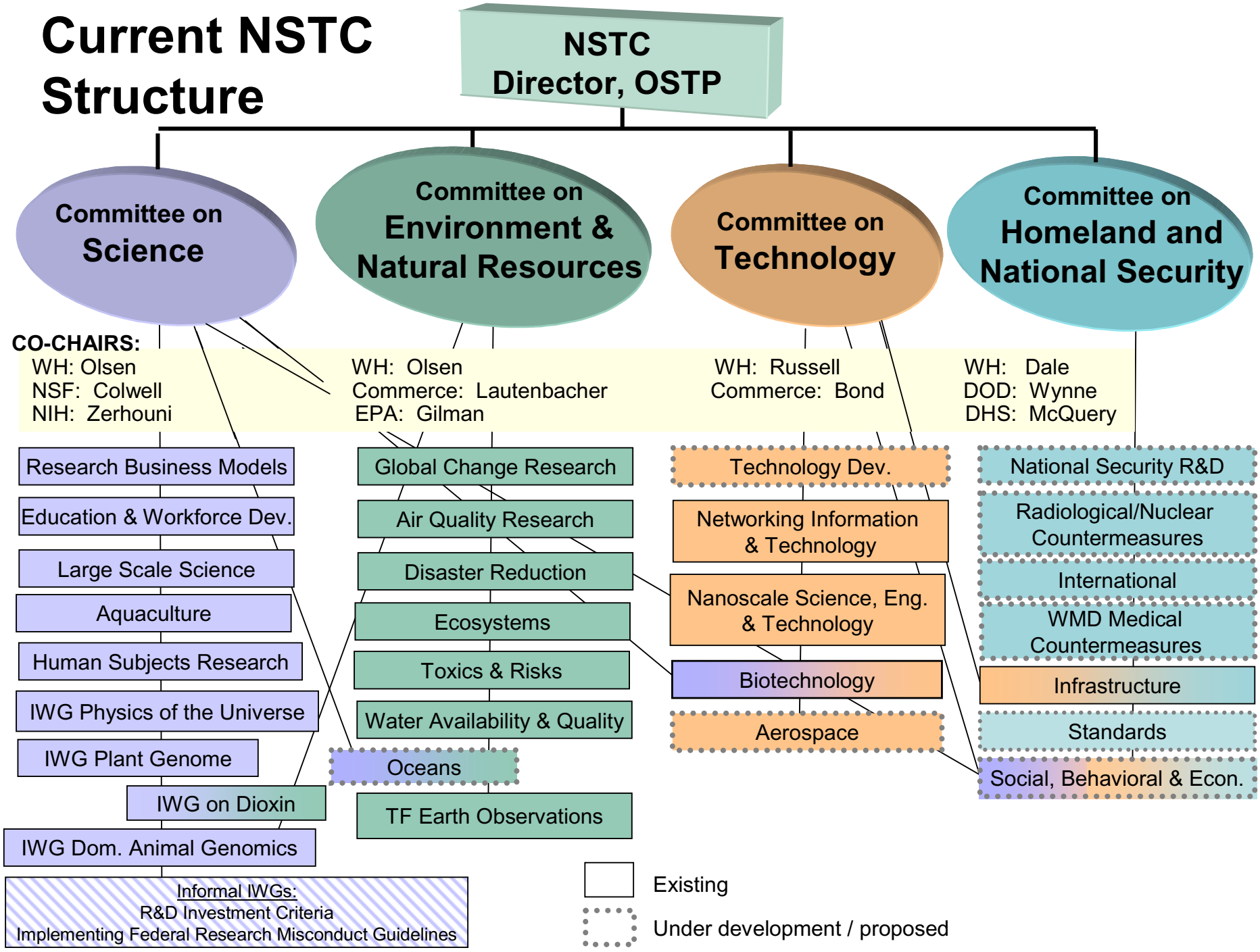
2.) Nanotechnology

3.) Networking and Information Technology R&D
(includes scientific computing)

4.) Molecular-level understanding of life processes
- non-biomedical biology: plant genomics, animal genomics

5.) Environment and Energy
- climate change
- environmental observations
- hydrogen R&D

Current NSTC Structure



Physical Sciences Group Agency Coverage

Department/Agency	Department of Energy			NASA	National Science Foundation			Commerce	Smithsonian
Physical Science Discipline	Office of Science	Nuclear Programs	NNSA	Office of Space Science	Engineering	Mathematical and Physical Science	Polar Research	NIST	
Astronomy				X		X	X		X
Astrophysics	X			X		X			X
Biophysics						X		X	
Chemistry	X			X		X		X	X
Materials Science	X			X	X	X		X	
Mathematics						X			
Physics									
Atomic and Molecular				X		X		X	
Fusion and Plasma Physics	X		X	X		X			
High Energy and Elementary Physics	X			X		X	X		
Relativity				X		X			X
Condensed Matter (Solid State, etc.)	X					X		X	
Polymer Science	X				X	X		X	
Nuclear Engineering		X		X					
BUDGET	$3B			$4B		$1 B		$0.5B	

Physical Science Issues

- Existing Facilities
  - Operations
  - Upgrades
  - Shutdowns/Transfer of Stewardship
- Facilities Under Development
  - SNS
  - LHC
- Facilities Decisions
  - ITER
  - LISA/Con-X
- Proposed Facilities
  - Underground Laboratory
  - RIA
  - SNAP
  - Linear Collider
  - LCLS
  - GSMT
  - Ad Infinitum

NSTC Activities

- Quarks to the Cosmos
- Large Scale Science
- R&D Investment Criteria
- Research Business Models


Astronomy and Astrophysics in the New Millennium
An Assessment of the Department of Energy's Office of Fusion Energy Sciences Program
Physics in a New Era
An Overview
U.S. Astronomy and Astrophysics
MANAGING AN INTEGRATED PROGRAM
THE SCIENCE AHEAD
THE WAY TO
DISCOVERY
Particle Physics in the 21st Century
Connecting
Quarks
Cosmos
LARGE SCALE
BIOMEDICAL SCIENCE
OPPORTUNITIES IN NUCLEAR SCI
A Long-Range Plan for the Next Decade
Research Teams and Partnerships: Trends in the Chemical Sciences
BEYOND EINSTEIN:
from the big bang to black holes

There is a changing environment for large scale science program investments:

- Traditional fields are proposing a significant number of new facilities and asking for significant new $.
- There is an increased competition from emerging fields. Some will most certainly be deserving of funding.
- We have a large installed base of existing facilities - some may be under utilized, some may be redundant, many need upgrades.
- There is a greater emphasis by the administration on understanding what we are getting for our investment, minimize redundancy, maximize return on large existing investment base.

Some Observations:

- Total estimated cost of recommended facilities exceeds optimistic budget projections. (factors of 2 – 3?)
- Related R&D programs tend not to be well coordinated across the Government. Lack the ‘big picture’ perspective.

Conclusion:

- Lots of good ideas. Many not ready for prime time.
- We could saturate our available budgets with low priority, redundant, or uncoordinated activities.
- We need to get better, more critical, and broadly coordinated advice on priorities for investment.
- Need to get a uniform policy for “making the case.”

FY 2005 OSTP/OMB Priorities Memo

Some agencies operate *programs or facilities whose capabilities are important to the missions of other agencies*. Such programs and facilities will be given special consideration in budget preparations. Consistent with the President's Management Agenda, it is imperative that, where appropriate, federal R&D investments be managed as a portfolio of potentially interconnected activities to *optimize scientific discovery through interagency coordination of related research areas.* OSTP informs the budget process regarding the availability of instrumentation and facilities for S&T priorities and the need for coordination of related research programs based on information generated through the National Science and Technology Council (NSTC) and other interagency mechanisms.

http://www.ostp.gov/html/new.html

FY 2005 OSTP/OMB Priorities Memo

The President's Council of Advisors on Science and Technology has urged increased investment in certain areas of physical science, citing opportunities for continued scientific discovery and the fact that such discoveries often drive advances in other areas of science. Budgetary proposals for these or any other area must be specific regarding how the programs will expand scientific frontiers in a manner consistent with stated agency missions and national goals and demonstrate coordination with similar programs in other agencies. The desire to achieve parity in funding levels among disciplines does not by itself suffice to justify funding increases.

…there is a need for a new emphasis on, and perhaps even a redefinition of, strategic planning in high energy physics.

- As a first principle of planning, machines and instrumentation must be subordinated to a broader view of the field.
- A second principle of strategic planning must be to acknowledge the impact of one area upon another…
- A third important component of a new approach to strategic planning is the international dimension.

from **Remarks given at FERMI Lab Users Meeting, June 3, 2003**

…it is clear to me that the fates of deep space astronomy and particle physics are strongly entwined. In the long run, the future of particle physics lies in space-based experiments, and its productivity will depend on having a model of nature that is complete enough to exploit cosmic phenomena as a guide to theory. Now is the time to begin preparing for the long run.

John H. Marburger, III

President's Science Advisor *and*

Director, Office of Science and Technology Policy

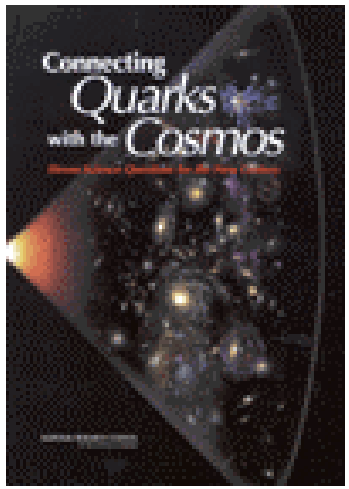
from **Remarks given at SLAC's 40th Anniversary Celebration**

NSTC IWG on The Physics of the Universe

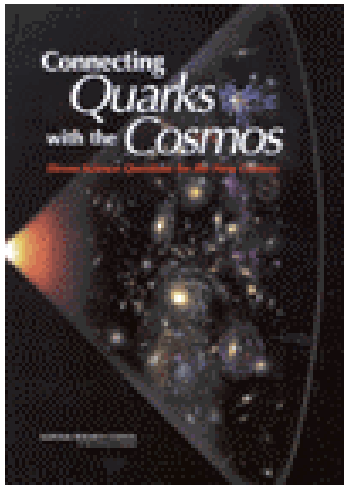
Co-chairs: Anne Kinney, Joe Dehmer, Peter Rosen (Robin Staffin)

Participation:

- NASA OSS
- NSF (Astronomy, Physics, Office of Polar Programs),
- DOE
  - High Energy and Nuclear Physics
  - Fusion Energy Science
  - NNSA
- OSTP, OMB



Quarks to the Cosmos Report



1. What is the Dark Matter?
2. What is Dark Energy?
3. How did the Universe Begin?
4. Did Einstein have the last word on gravity?
5. What are the masses of the neutrinos and how have they shaped our universe?
6. How do cosmic accelerators work and what are they accelerating?
7. Are protons unstable?
8. What are new states of matter at exceedingly high density and temperature? (HED)
9. Are there additional space-time dimensions?
10. How were elements from iron to uranium made?
11. Is a new theory of matter and light needed at the highest energies?

Response to Quarks to the Cosmos

- What are the approaches to answers?
- What suite of tools are needed?
- What are the highest priorities?
- What are the “tall pole” policy issues?

- Define steward agencies for fields and tools.
- Define who will do what and when (as best we can).
- Bring items up for a decision in a timely manner.

POU: Prioritization of Recommendations
Step 1

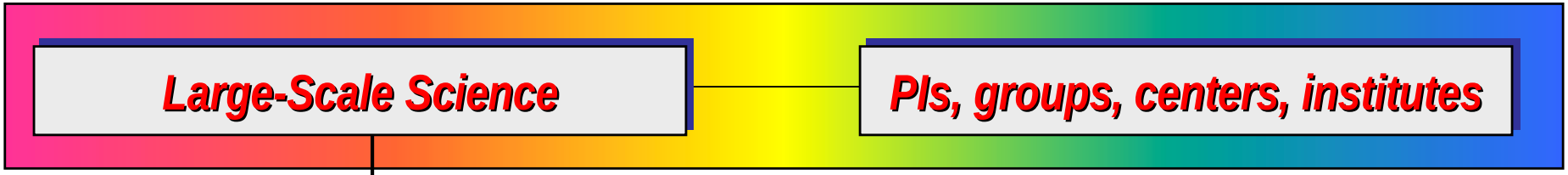
- Inventoried current investments.

- Ranked the 11 scientific questions using:
  - potential for scientific advancement
  - timeliness for the investment
  - technical readiness of projects
  - existence of gaps in current investments

POU: Prioritization of Recommendations
Step 2

- Start with questions prioritized in terms of investment priority.
- Sort or group questions into themes that are programmatically linked across agencies (e.g. dark matter, neutrinos, proton decay).
- Develop recommended actions for each theme area (across agencies)
- Assess programmatic readiness to proceed.
- Grouped into:
    - o Programmatic Directions known (THE PRIORITIES NOW)
    - o Programmatic Directions not certain: Roadmap/flesh out areas in more detail. (NEXT STEPS)

NSTC Sub-Committee on LSS



Facilities and Megafacilities

Definition
Life-cycle planning
Single agency vs. multiagency
Private vs. federal
National vs. international
Management models
Definition of user
User access
Examples:
- ALS, APS, SSRL, NSLS, SNS
- LHC, Tevatron, SLAC, ITER

Distributed Facilities

Definition
Life-cycle planning
Single agency vs. multiagency
Private vs. federal
National vs. international
Management models
Definition of user
User access
Examples:
- NEON, Global Observing System, ARM, Oceanographic Fleet, Genomes to Life

Data-intensive Projects

Definition
Life-cycle planning
Single agency vs. multiagency
Private vs. federal
National vs. international
Management models
Definition of user
User access
Examples:
- HGP, NVO, Sloan Digital Sky, SNP Consortium

Connecting the Quarks to the Cash: 11 Science Policy Questions for a New Facility:

1. What are the driving scientific questions for the field?
2. How do these questions fit into the larger picture of science?
3. How will this investment address the driving questions?
4. Is this a priority?

5. Do you have consensus within the field?
6. How will this impact the rest of the field? (+ and –) (including $$)
7. Is the planning realistic ($, time, available technology, management, etc)
8. What is the international context? Is it redundant? Do you have international participation?

9. Is anyone outside of the field waiting for the results? (Will they voice there opinion and support?)

10. Can you demonstrate coordination with other programs?

11. How has is the program managing and performing with the current funds?

end

http://www.whitehouse.gov/omb/budget/fy2004/pma/highenergy.pdf

Program: *High Energy Physics*

Rating: *Results Not Demonstrated*

Agency: *Department of Energy*
Bureau: *Office of Science*

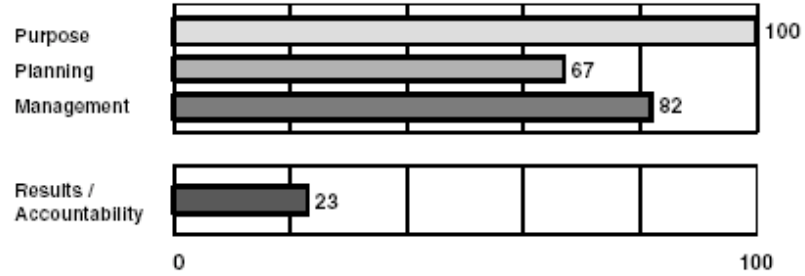
Program Type: *Research and Development*

Program Summary:

The Office of Science's High Energy Physics (HEP) program supports large national and international particle accelerator experiments and research in high-energy (particle) physics and related fields, including particle astrophysics and cosmology.

The program received a perfect score in the purpose section and a high score in the management section, mainly as a result of standard management practices within the Office of Science that lead the HEP program to have a well defined mission and merit-based reviews for awarding contracts and grants. A cause for the lower scores for planning and results is the program's current lack of adequate long-term and annual performance measures. Nevertheless, the program has made significant strides toward developing such measures despite the problems inherent in measuring and then predicting scientific progress. Other findings include:
1. The program's results score was lowered further because of two construction and upgrade projects that are underperforming or over budget/schedule, in part because the program is undertaking several high-risk projects simultaneously.
2. The program coordinates its research strategy with the National Science Foundation through a jointly sponsored advisory committee; however, the program does not yet have regular reviews of its research portfolio and processes by ad hoc panels composed of outside experts external to its advisory committee.

To address these findings:
1. The 2004 Budget will focus resources on addressing construction and upgrade problems while operating the program's fully-functioning user facility at 87 percent of maximum capacity (the same as in 2003 and 9 percent more than in 2002).
2. The Department will institute a priority-setting mechanism for ranking medium and large construction projects within the program that have not yet reached the full construction phase.
3. The Administration will work to reform its performance measures and goals, while being sensitive to the problems that basic research programs face in attempting to predict future scientific progress.
4. The Department will institute a formal committee of visitors process for the program by September, 2003.



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Measures under development			
Annual Measure: Measures under development			

Program Funding Level (in millions of dollars)

2002 Actual	2003 Estimate	2004 Estimate
713	725	738